TT6
USER'S MANUAL

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INTRODUCTION

To ensure your successful use of the TransTerm 6, 6A or 6B, this handbook contains all the necessary information for installation, interfacing, operation and programming of the terminal. Features unique to either the 6A and or 6B models are so noted.

This manual presents material relevant to the TransTerm 6, 6A and 6B models. Most of the features and capabilities are common to all three models with the TT6A having some enhancements over the TT6 primarily in the I/O options, and the TT6B offered soly for configurations requiring multiple I/O options.

Specifications and information
herein are subject to change without notice.

CHAPTER 1
Functional Overview

The TransTerm 6 is a self-contained keyboard/ display terminal which is designed to transmit and receive information interactively to/from a central computer or other similar communications capable device.

To better understand how the TransTerm 6 operates, Figure 1-1 presents a block diagram of the major functional elements of the TransTerm 6. Each of the functional elements of the terminal will be briefly described here.

The **keyboard** is used by the operator to input character codes for transmission to the host computer or, depending upon the mode of operation, for local presentation on the display or local terminal functions. The keyboard is a 53 key sealed membrane switch array with an embossed graphic overlay. Each valid keystroke will be accompanied by an audible "click" sound for positive operator feedback.

The **display** is a two line by 40 character electro-reflective liquid crystal display. It can display all of the 96 standard ASCII character set in a 5 x 7 dot matrix font and has a blinking cursor symbol to indicate current character placement. The display has as its primary purpose to visually present to the operator all valid displayable ASCII codes which are received via the Communication port, or that are operator entered in Modes 2 and 3. The display is also used to present the terminal setup parameter values to the operator in the setup Mode. A display backlight option is available which is infact a different display module that incorporates an electroluminescent (electro-chemical) lighting element behind the liquid crystal display. It is preferrable to order the TT6 with the backlight option rather than to add the option after the origional purchase. The TT6B, when equipped with the backlight, will automatically extinguish the light after five minutes of inactivity, and restore the backlight when keyboard entry resumes.

The **communication port** serves as the interface between the TransTerm 6 and the computer (by direct connection or via a modem). The communication port takes data entered from the keyboard (in Mode 1) or data in the display memory and transmits it in serial asynchronous format at the selected baud rate and character parity. The communication port also deserializes received data and places it in the input buffer. The standard communication port has an RS-232 serial interface on a DB-25F connector. The port can be optionally equipped with the RS-422 compatible TNET interface for networking applications or long cable runs. The TNET interface signals are available on the DB25F connector and can optionally be sourced on a RJ45

modular jack (-M model).

The **input buffer** is a 16 (100 in the TT6A & TT6B models) character first-in / first-out (FIFO) memory used to temporarily hold data which has been received by the communications port. Data is subsequently removed from the input buffer and routed to the display buffer or operated upon as is the case for ASCII control codes.

The **barcode interface** option (TT6A and TT6B models only) is a built-in interface for a hand-held optical wand, CCD scanner or laser scanner which will autodiscriminately decode bar code symbols in any one of several symbologies (Code 39, Code 128, Interleaved 2 of 5, UPC/EAN, and CODABAR). The decoded data will be placed on the display screen at the cursor position and/or transmitted out the serial I/O port (depending on the operating mode and setup configuration).

The **magnetic stripe reader interface** optioan (TT6A and TT6B models only) is a built-in interface for the MR-211 magnetic stripe card reader. It is capable of interfacing to a track 2 or a track 1 reader on the TT6A model, or a track 1 and 2 dual reader on the TT6B model. The data read from the card is transfered to the display buffer at the cursor position and/or transmitted out the communication port (depending on the operating mode and the setup configuration).

The **auxillary serial I/O port** option (TT6A and TT6B models only) is a built-in interface which provides serial communication, at a user selectable baud rate, with other RS-232 compatible devices (serial printer, weighing scale, etc.) The TT6A Aux port is uni-directional half-duplex and the TT6B Aux port is bi-directional full-duplex.

CHAPTER 2
Installation

GENERAL

This chapter contains information related to the unpacking and installing of the TransTerm 6 terminal. The installation procedure includes power application, hookup and power-up checkout procedures.

UNPACKING

The TransTerm 6 is packed in a reinforced cardboard carton containing the following items:

TransTerm 6 terminal
AC power adapter
Operator's Manual
Optional equipment

Remove each of the above mentioned items from the box and inspect each item and the box itself for physical damage. Notify the shipper and selling agent immeadiately of any damage.

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WARNING

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Subjecting the Liquid Crystal Display to temperatures above 70 C or below -20 C for extended periods of time could permanently damage the display.

The TransTerm 6 is designed to either set on a horizontal surface such as a desk or table top (consider the optional "tilt stand" for this situation), or to be mounted on a vertical panel or wall (consider using the optional "tilt bracket" for this situation). For O.E.M. applications, the terminal can be removed from its enclosure and panel mounted behind a cutout of appropriate size.

CHAPTER 3
Connection and Power-up

CONNECTION

Depending on your installation requirements (see Chapter 10), connect the cable from your computer or modem to the TransTerm 6 RS-232 I/O connector (DB-25F) or for TNET network installations, use the RJ-45 modular jack (See Figure 3-1). Next insert the power plug from the wall plug-in power adapter into the jack next to the I/O connector and plug the power adapter into a nearby 115 VAC outlet. For TNET networks, you will be able to source 12Vdc power from the TLD2 line driver to which you connect the terminal provided the cable length is not greater than 100 feet.

NOTE

The TransTerm 6 has no fuse or power on/off switch. Within one second, three loud beeps will be heard to indicate that a successful power-up reset has occurred and that the unit is ready for operation. If more than three beeps are announced, the terminal is making an exceptional power-on sequence due to there being invalid setup data in the EEPROM.

POWER-UP AND CHECKOUT

A power-up self test verifies proper internal operation of the TransTerm 6 terminal each time power is applied or a keyboard entered reset is initiated. Perform the following procedure to power-up and check out your TransTerm terminal.

1. Apply power to the unit by inserting the AC power adapter's miniature phone plug into the terminal's power jack. The terminal will announce its successful power-on sequence by presention on the display as follows:

   Model 6 "TRANSTERM 6 -ROM OK-EEROM OK"
   Model 6A "TRANSTERM 6A"
   Model 6B "TRANSTERM 6B"

   The battery-powered version of the model 6B will power up by depressing the "TRANSTERM" logo.

2. After a correct power-up, select the desired set-up features as described in Chapter 6. This would include the adjustment of the display contrast for

the viewing angle of the installed terminal.

3. The new set-up features selected will be programmed into the terminal's non-volatile memory.

CHAPTER 4
Communication

GENERAL

The TransTerm 6 can be connected directly to a local computer or to a modem for remote telecommunications.

For direct connection, the standard RS-232 or optional RS-422 (TNET) interface may be used. Generally speaking, the consideration of cable distance is the determining factor in choosing which of the two interfaces is preferred. For a connection of less than fifty feet, the standard RS-232 interface will serve; and for point-to-point connections greater than 50 feet or when multiple terminals are to be hooked into one serial port, the RS-422 compatible TNET interface option is necessary as is the TIM1 network controller.

SERIAL DATA FORMAT

The TransTerm 6 terminal communicates using a serial asynchronous data format. Each character is transmitted using a leading start bit, 7 or 8 data bits, a parity bit, and one or two stop bits. The data bits are transmitted and received with the least significant bit first in time sequence followed by the parity bit and the stop bit(s). The terminal's serial receiver needs to receive only one stop bit for proper operation and is unaffected by the receipt of more than one stop bit. The terminal's transmitter always transmits two stop bits and therefore is compatible with a receiver set for either one or two stop bits.

The parity bit is used to detect single bit errors in the received data on a per character basis. The parity selection setup Bits in SR1 "PEN", "PS1", and "PS2", enable or disable parity generation and checking and determine the state of the parity (even/odd/mark/space) bit which will be transmitted by the terminal and checked by the receiver.

RS-232 INTERFACE

The TransTerm 6 communication interface signals are available on a connector which is accessible through a cutout in the side of the unit. The connector is a DB-25F (EIA RS-232 type) female. The addition of either of the optional interfaces (20 ma current loop or RS-422) will not affect the availability or operation of the RS-232 signal inter-

face. The signals and pin assignments for the EIA RS-232 interface are described in detail in Appendix B.

LOCAL KEYBOARD ECHO (TTY Mode only)

In normal operation with an external modem the TransTerm 6 will transmit and receive data simultaneously. Data entered on the keyboard will be transmitted out the communications port; however, with local echo enabled (LKE), the keyed data is also presented locally on the display in addition to being transmitted.

CHAPTER 5
Keyboard Operation

The TransTerm 6 keyboard delivers operator keyed input to the terminal. In so doing it generates ASCII codes that, depending on the Mode of operation, are either transmitted out the communications port or processed and/or displayed internally within the terminal.

The TransTerm 6 keyboard (See Figure 5-1) is a flat panel membrane keyswitch array configured in a typewriter arrangement (QWERTY) with key elements located on .8 inch center-to-center placement. The array is covered by a four color graphics overlay which also includes a clear hard-coated window (hermetically sealed) covering the display screen. The 53 key array consists of 42 character keys with white backgrounds, eight special function keys with blue backgrounds, plus a **CONTROL** key and two **SHIFT** keys (the latter three keys also have blue backgrounds but do not generate any ASCII codes).

The forty-two white keys are used to generate the standard 26 alphabet characters and special symbols which make up the standard ASCII character set. Those keys legended with two characters, one above the other, will require the operator to depress and hold one of the two **SHIFT** keys while depressing the key in question to generate the "shifted" character for that key. Additionally, the ASCII control codes can be generated in the same manner by depressing and holding the **CONTROL** key (lower left corner) while depressing the desired alpha key.

The remaining eight blue keys are special purpose keys which transmit a unique ASCII control code in Mode 1 or perform an internal function in Modes 2 and 3. The local functions in Modes 2 and 3 are as described for the respective control codes in Chapter 7. The keys along with their default control code values are listed below in Table 5.1.

Table 5.1
Function Keys

Key	Legend	ASCII	Hex
1	CLEAR	CAN	18
2	ENTER	EM	19
3	DELETE	DEL	7F
4	ESCAPE	ESC	1B
5	RETURN	CR	0D

6	LF		LF	0A
7	SPACE	SP	20	
8	SPACE	SP	20	

The code(s) that these eight keys generate can be changed with the **LFK** ESCape sequence command as described in Chapter 8. Each key can be programmed to generate no code(s), one code or two codes (or up to 14 codes in the case of the model 6A and 6B) when that key is pressed. These eight keys are in effect programmable function keys, except that the legends are fixed on the standard graphics overlay covering the front of the terminal (custom overlays are available).

There are also three special key sequences for the battery-powered version of the Model 6B.
There is also a "hidden" key under the TransTerm logo in the upper right hand corner of the TransTerm 6. Pressing this key will cause the TransTerm 6 to perform a power-up reset or in the case of the battery powered 6B version, will actually turn the unit on.

CHAPTER 6
TransTerm 6 Set-Up

GENERAL

The TransTerm 6 (6A,6B) has many built-in features that are selectable by the user for his particular application. The operator may "program" the TransTerm 6 for the features he wishes to utilize. Once entered or changed, the "programmed" setup configuration is saved in permanent memory even when the terminal is turned off. At power-up reset time the setup values are used to establish the operating characteristics of the terminal. When you are satisfied with the features as selected you may inhibit further setup feature modifications from the keyboard by setting Bit 7 in Register SR3.

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> Once this bit has been set you must use one of the ESCape sequence commands described in Chapter 8 to regain keyboard access to the setup Registers, Or you can do a total restoration of the factory default setup by performing the procedure outlined in Appendix G.

The setup features can be programmed into the Setup Registers using keyboard entered commands in the "SETUP Mode. When the left-hand **SHIFT** key and the **CONTROL** key are depressed simultaneously, the TransTerm 6 will enter the Setup Mode. Any data which was on the display will be erased and thus lost.

SETUP MODE

Once in the Setup Mode, the contents of each of the setup registers is presented to the operator for his/her review along with the option of entering a new set of values into each register. Each register is represented in the form of eight binary digits each of which can be either a one or a zero value. Generally, where applicable, a one '1' will enable a feature and a zero '0' will disable a feature. Each register's contents is presented on the display in the following format:

```
SR  12345678 12345678
SR1 00101100
```

When you have keyed in the new "1"s and "0"s for the register, depressing the **ENTER** key will cause those bits to be entered into the internal register and the display to advance to the next register. When there are no changes to be made to the bits in a register, depressing the **ENTER** key will advance the display to the next register. When the user is through examining and/or modifying the registers, depressing the **CLEAR** key will exit the Setup Mode with any and all changes being stored in permenant memory. The keys on the keyboard which are illegal for the Setup Mode operation will cause an Audible Beep to be sounded if they are depressed.

Following the last setup register, the user is presented with several additional parameters which he can examine and/or modify at his discretion. These parameters are the Operating Mode, Contrast, Unit Address, Total Columns, (and Options in the 6A and 6B).

SR4,SR5 and SR6 are used exclusively for Setup parameters for the options which can be installed in the TT6A and/or TT6B models. Therefore, depending upon the particular option installed, if any, the bit assignments will vary as to their assigned purpose.

In certain circumstances, due to known or unknown causes, the TransTerm 6 may fail to operate properly, or may become locked out of the Setup Mode because the DSM bit in setup register 3 has been set to a '1'. In either either of thses situations, the following procedure will clear the TT6 Setup memory and reprogram it with the origional settings that it contained when it arrived from the factory.

See Appendix G for the procedure(s) to restore the factory default Setup.

SUMMARY OF SET-UP FEATURES

Set-Up Register No.	Bit Name		Function
1	1	BR1	Baud Rate Selection
1	2	BR2	Baud Rate Selection
1	3	BR3	Baud Rate Selection
1	4	PS1	Parity Selection
1	5	PS2	Parity Selection
1	6	PEN	Parity Enable
1	7	DBS	7/8 Data Bits
1	8	CSE	CTS Enable
2	1	EKR	Enable Key Repeat

2	2	LKE		Enable Local Echo
2	3	ELW		Enable Line Wrap
2	4	ENL		Enable New Line
2	5	ELM		Enable Line Mode
2	6	XAL		Send All Data
2	7	AKE		Auto Kbd Reenable
2	8	EXP		Enable Xon/Xoff
3	1	DKB	6A/B	Disable Keyboard
3	2	DPT	6B	Disable Bklite Timeout
3	3	ELC	6A/B	Enable L/C Shifting
3	4	DRS		Disable Reset Msgs
3	5	—		Spare
3	6	—		Spare
3	7	DSM		Disable 'SETUP' Mode
3	8	—		Spare
4	1-8	—	6A/B	See Appendices
5	1-8	—	6A/B	See Appendices
6	1-8	—	6A/B	See Appendices

6A/B - Setup bits for TT6A and TT6B models only.

SET-UP BIT DEFINITIONS

BR1, BR2, BR3

Baud Rate—These three bits are used to set the serial bit rate clocking frequency for the terminal's communications port.

BR1	BR2	BR3	Rate
0	0	0	9600
1	0	0	4800
0	1	0	2400
1	1	0	1200
0	0	1	19200
0	0	1	300
0	1	1	150
1	1	1	110

PS1, PS2

Parity Selection — These two bits determine the state of the parity bit for transmitted characters.

PS1	PS2	Parity Bit
0	0	Space
1	0	Mark
0	1	Even
1	1	Odd

PEN

Parity Enable — When PEN is set, a parity bit who's state is determined by PS1 and PS2 is appended to the data bits of the transmitted and received data character.

DBS

Data Bit Select — When the DBS bit is set (1) the data bits per character is eight. When DBS is cleared (0) the data bits per character is seven. This count excludes the Start, Stop and/or any Parity bit specified. If the PEN bit is cleared (0), and the DBS is cleared (0) (7 bits), then a parity bit of zero is transmitted. If you are using the TT6A or TT6B in Mode 3 with UAC's above 127 (decimal), or you wish to use the broadcast address capability (UAC=255) to display a "clock" on all your terminals; DBS must be set (1) to eight bits per character.

CSE

CTS Enable — When the CSE bit is set (1) the TransTerm 6 logic will sense the state of the CTS signal (RS-232 pin 5) before it transmits data out the communication port. If CTS is false, the transmission will not commence and will be held off until the CTS signal returns to a true state. When the CSE bit is cleared (0), the state of the CTS signal is ignored by the terminal.

EKR

Enable Key Repeat — When EKR is set (1) and a keyboard key is held depress for more than one half a second, the keyboard will generate the same key code repeatedly at a rate of eleven per second until the key is released.

LKE

Local Keyboard Echo— When LKE is set (1), data generated by keyboard entry in addition to being transmitted out the communications port is internally echoed back to the terminal input for effective half-duplex operation.

ELW

Enable Line Wrap — Whenever ELW is reset (0) and the cursor is on the last character location of the line, the next character placed on the display will overwrite the last character on the current line. If ELW is set (1), and the cursor is on the last character location of the line, the next character will cause the cursor to move to the next line and that character to be placed in the left-most position of the new line. If the cursor is on the bottom line of the display at this occurence, then the display will scroll up one line unless scrolling is disabled by ELM being cleared (0).

ENL

Enable New Line — When ENL is set (1), it will cause "LF" codes received by the terminal to be interpreted as a "CR" and "LF". When ENL is cleared (0) the ENTER key will generate a "CR" in Mode 1 and when ENL is set (1) the ENTER key will generate a "CR" and "LF" in Mode 1. If LKE and ENL are both set (1) in Mode 1, then a "CR" will be locally echo'd and a "CR" and "LF" will be transmitted.

EML

Enable Line Mode — When the ELM bit is cleared (0), the display buffer is organized as a fixed page and scrolling is inhibited. The cursor will not advance beyond the last line of the display nor will the top line be lost due to scrolling. In addition, in Modes 2 and 3, when ELM is cleared (0), all keyed data in the display buffer is transmitted when the ENTER key is depressed, and when ELM is set (1), only keyed data on the current line (cursor location) will be transmitted. (See XAL bit for additional permutations.)

XAL

Send All Data — When the XAL bit is set (1), in Modes 2 and 3 the terminal will transmit all of the data in the display buffer at the time the ENTER key is depressed. When the XAL bit is cleared (0),

only the key-entered data in the display buffer is transmitted.

AKE

Auto Keyboard Re-enable — When the AKE bit is set (1), in Mode 2 the terminal will automatically have its keyboard re-enabled after completing transmission of the data for the previous ENTER operation. When the AKE bit is cleared (0), the terminal's keyboard will remain disabled until it has received an ASCII SI code.

EXP

Enable Xon/Xoff Protocol— When the EXP bit is set (1), the terminal will transmit the ASCII XOFF (Hex 13) code whenever the input buffer is full. When the input buffer is again empty the XON (Hex 11) code is transmitted. When the EXP bit is cleared (0), this procedure is disabled.

DKB (6A,B)

Disable Keyboard — When DKB is set (1), keyboard input will be inhibited. Input from optional interfaces will be permitted. This is normally set and cleared under program control to temporarily accept data solely from the optional input device (TT6A/B only).

DPT (6B)

Disable Power Timeout — When DPT is set (1), the backlight for the LC display remains on at all times. When DBT is cleared (0), the display backlight turns off automatically after 5 minutes of idle time, and will relight when activity resumes. Battery powered models will power down entirely.

ELC

Enable Lower Case — When ELC is set (1), depressing either of the **SHIFT** keys while pressing an alpha key on the keyboard will produce the equivalent lower case ASCII code for that alpha key (6A/6B only).

DRS

Disable Reset Messages — When the DRS bit is set (1), the messages presented on the display during the power-up reset sequence will be inhibited.

DSM

Disable Setup Mode — When the DSM bit is set (1), the operator will no longer be able to gain access to the SETUP Mode from the keyboard of the TransTerm 6. You are in effect locked out of the SETUP mode and can no longer modify any of the SETUP registers.

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To re-gain such access, the terminal would have to be connected to another RS-232 compatible ASCII device and the appropriate ESCape Command (See CSB in Chapter 8.) would have to be transmitted to the TransTerm 6 from the attached device to clear the DSM bit and regain keyboard access to the SETUP Mode. If the user is unable to clear the DSM bit remotely, then the user will have to perform one of the procedures outlined in Appendix G.

OPERATING MODE — Enter a value of 1,2 or 3. (See Chapter 9.)

CONTRAST — Enter a value from 1 to 7 and observe display from normal viewing angle for each contrast value. Repeat until satisfactory.

UNIT ADDRESS — Enter a value from 001 to 250 for the Mode 3 UAC address code.

TOTAL COLUMNS — Enter a value of 40. (A value of greater than 40 for the TransTerm 6/6A/6B will create extra bytes of hidden data storage into which key-entered data can be stored unseen by the terminal operator. This facility might typically be used to key-enter a password, etc.

OPTIONS — (TT6A/B only) Enter a numeric value which will be interpreted by the particular option installed in the TT6A/B (bar code interface option, magnetic stripe card reader interface option, auxilliary serial port option).

CHAPTER 7
Control Codes

The TransTerm 6 recognizes many commands which cause it to take action other than merely placing ASCII codes in the display buffer and corresponding character fonts on the display screen. In this way the host computer can command the terminal to perform special actions such as moving the display cursor about the display, sounding the internal alarm, etc. These control commands are of two (2) types, singular ASCII control codes and Escape sequences (see Chapter 8).

The individual ASCII control codes (Hex 01-1F) are summarized and defined below. All other ASCII control codes are ignored by the TransTerm 6.

ASCII	HEX		ACTION TAKEN
NUL	00		Always ignored by the TransTerm 6 and 6A.
ENQ	05		(Mode 3 only) Request terminal to transmit data (depending on the XAL bit) in display memory. If the enter flag is set, the data will be transmitted.
BEL	07		Causes the audio alarm to sound for 250 msec.
BS	08		Will move the cursor one character location to the left, unless cursor is at the left margin.
HT	09		Will move the cursor one character location to the right, unless the cursor is at the right margin.
LF	0A		Moves the display cursor down to next line on the display. If the ENL bit is set, a "CR" and "LF" will be performed.
VT	0B		Move the display cursor up to the top line unless the cursor is already on the top line.
FF	0C		Clears the display and places the cursor on the top line and in the left-most column.
CR	0D		Moves the cursor to the left-most column of the current line.
SO	0E		Disable the keyboard if it is enabled.
SI	0F		Enables the keyboard if it is disabled.
DLE	10		For cursor addressing the DLE is followed by a single character code with a value between Hex 20 and 6F that defines a new cursor location on the display (TT6 only).
DC1	11		XON character to re-enable serial data transmission.
DC2	12	6A/B	Route received data to the optional I/O device. After this

			code is received by the TT6A/B terminal, all data received is routed to the optional output device (i.e. auxilliary serial port) if it is installed.
DC3	13		XOFF character used to disable serial data transmission.
DC4	14	6A/B	Route data to the display - Reverses DC2 code.
CAN	18		Clears key-entered data from the display buffer.
EM	19		Sets "SEND" Flag in Mode 3. Causes data to be transmitted in Mode 2.
ESC	1B		Lead-in character for Escape Command Sequences.
DEL	7F		Deletes the character to the left of the cursor from the display buffer and backspaces the cursor.

CHAPTER 8

Escape Sequence Commands

The host computer can issue commands to the TransTerm 6 in addition to the ASCII control characters by using an Escape Sequence Command. The first character of an Escape Sequence is always an ASCII "ESC" Escape code (Hex 1B) followed by one or more displayable ASCII character codes which complete the command. A summary of commands is listed below.

ASCII SEQUENCE	COMMAND NAME		ACTION TAKEN
ESC 1	SM1		Set Mode to 1
ESC 2	SM2		Set Mode to 2
ESC 3	SM3		Set Mode to 3
ESC A	TDL		Transmit Current Line
ESC B	TDB		Transmit Display Buffer
ESC C	CDL		Clear Display Line
ESC D	CDB		Clear Display Buffer
ESC E	SSM	6A/B	Set Suspend Mode
ESC F	CSM	6A/B	Clear Suspend Mode
ESC G l c LCA			Load Cursor Address
ESC H	HOM		Home Cursor
ESC K r	TSR	6A/B	Transmit Setup Register
ESC L d	LDC	6A	Load Display Contrast
ESC M r b	SSB		Set setup Bit
ESC N r b	CSB		Clear setup Bit
ESC R	TCA		Transmit Cursor Address
ESC S	SVB		Store setup Bits in EEPROM
ESC V r	TFK		Transmit Function Key Registers
ESC W r xxx	LFK		Load Function Key Registers
ESC X	RST		Terminal Reset
ESC Z	XID	6A/B	Transmit ID

Escape Sequence Command Definitions

NAME	ACTION TAKEN
SM1	Set Mode 1 — Causes the terminal to be placed in operating mode 1 - Teletype Compatible Mode.

SM2 Set Mode 2 — Causes the terminal to be placed in operating mode 2 — Block Send Mode.

SM3 Set Mode 3 — Causes the terminal to be placed in operating mode 3 — Polled / Multidropped Mode.

TDL Transmit Display Line — Causes all of the keyed data characters on the current display line to be transmitted to the host computer as a string. The string will be terminated by an ASCII "CR" (Hex OD).

TDB Transmit Display Buffer — Causes all of the keyed data in the display buffer to be transmitted to the host computer. The line will be terminated by an ASCII "CR".

CDL Clear display line — The keyed data on the current line in the display buffer will be cleared. The cursor will be positioned at the left most position. This command duplicates the clear key.

CDB Clear Display Buffer — All keyed data in the display buffer will be cleared and the cursor will be placed at the left-most position.

SSM Set Suspend Mode — This command causes the terminal (6A,6B only) to enter a suspended mode of operation wherein keyboard input is disabled and the cursor position is saved to allow the host computer to temporarily gain control of the terminal resources needed to place data independentlly in the display buffer.

CSM Clear suspend Mode — This command reverses the effect of the SSM command. The cursor is restored to its origional (stored) position and the keyboard is re-enabled.

LCA Load Cursor Address — This is a four (4) character (ESC, G, l, c) sequence that allows the host computer to place the cursor anywhere in the display buffer. The third character (l) defines the line number (1 or 2) and the fourth character (c) defines the column number (1-40). The range of l and c are defined below for the various configurations. Any value for l or c that is not in the valid range is defaulted to 1.

Hex Values for l and c (line and column)

Line	Column	Hex Value
1	1	20
2	2	21
	.	.
	.	.
	40	47

HOM Home — Will move the cursor to the far left column (1) of the top line of the display.

XSR Transmit Setup Register — This command will cause the terminal to transmit the the contents of the setup register specified by "r" (1-5) in the form of eight ASCII "1" and "0" digits that represent the state of each of the eight bits in the respective setup register. Least significant bit first.

SSB Set Setup Bit — This command allows the host computer to "set" an individual setup bit which in turn determines the terminal's operating characteristics. The SSB command is a four character sequence (ESC, M, r, b). The third character (r) selects the "register" and must be in the range of ASCII "1" — "8" (Hex 31- 38). Any invalid values for "r" or "b" will cause this command to have no effect. This command sequence should be used with care to avoid making irreversable changes such as to the baud rate, etc.

CSB Clear Setup Bit — This command is used to "Clear" a setup bit. It is a four character command (ESC,N,r,b) as defined for the SSB command.

TCA Transmit Cursor Address — This command is used by the host computer to ascertain the current cursor position. Upon receipt of the command, the TransTerm 6 will transmit its cursor address as a two character response identical to the LCA command.

SVB Store Setup Bits — This command will cause the TransTerm 6 to store all setup bits in permanent EEPROM memory.

TFK Transmit Function Key — This command is used to request the

terminal to transmit the contents of designated the function key register (1 thru 8) out the communication port. The TT6 transmits the register value in a four character message consisting of the ASCII representation of the hexidecimal values (00-FF) of each of the two bytes of the associated function key register. The TT6A and 6B transmit the contents of the requested function key as actual ASCII codes in one continuous string.

LFK Load Function Key — This command is used to modify the contents of any one of the eight function key registers as specified by the "r" character in the command sequence. For the TT6, the last four characters following the register number "r" are the ASCII representation of the hexidecimal values (00-FF) to be placed in the two bytes of the associated function key. For the TT6A and 6B, in addition to the above mode, the data bytes following the register number "r" may optionally contain the actual ASCII codes which are to be put in the function key register delimited by a unique character at the beginning and end of the ASCII string. The delimiter used cannot be one of the ASCII numeric codes, nor can it be used in the string being loaded. The terminal will require five milliseconds to load each character into the function key storage memory.

RST Reset — This command has the same effect as applying power to the unit. A complete terminal reset is performed.

XID Transmit Terminal ID — This command will cause the terminal (6A and 6B only) to send the following ASCII message back to the host computer:

TT6X Vx.xx

where x.xx is the current version of the resident firmware (ie. "V3.37").

CHAPTER 9
Operating Modes

The TransTerm 6 has three standard operating modes: Mode 1 - Teletype Mode. Mode 2 - Block Send Mode, and Mode 3 - TNET Multidrop Mode. The operating mode of the terminal can be set and/or changed in the SETUP Mode (See Chapter 6) or by receipt of one of three ESCape Commands SM1, SM2, and SM3 (See Chapter 8.)

Mode 1 — TTY Mode

In this mode the TransTerm 6 operates as a separate display and keyboard. All characters received via the serial communication port are either displayed or the appropriate function is performed. All data entered on the keyboard causes the corresponding character code to be transmitted out the communication port independently of the recieve activity. If Local Echo is enabled (LKE, See Chapter 6), the keyed data will also be locally placed on the display screen.

Mode 2 — Block Send Mode

In the Block Send Mode all received character codes are operated on as in Mode 1. The displayable character codes entered from the keyboard are sent to the display and function keys cause the function to be performed locally within the terminal. Once a message has been entered on the display, depressing the "ENTER" key will cause all or part of the entered data (depending on setup bit XAL) to be transmitted out the communication port and the keyboard to be disabled (depending on setup bit AKE). Each line of the transmitted message is terminated with a "CR" or a "CR/LF" depending on setup bit ENL. The keyboard will remain disabled until it is re-enabled by a SI control code from the host computer.

Mode 3 — Multidrop Mode (for TNET operation)

This mode allows up to 250 TransTerm terminals equipped with the optional TNET interface (RS-422) to share a common communication link with a central network controller which is inturn attached to a host computer. Each terminal on the network must have a unique address (as established in setup Mode — See Chapter 6) and communication with the TIM1 network controller requires the terminal(s) to be polled by the TIM1 using the "POLLING" sequence. In this manner, each terminal is selected by receipt of the selection character (SOH) followed by the unit address character. Once selected, the terminal will be able to receive ASCII data in a manner similar to Mode 2. Characters entered from the keyboard are placed into the display buffer

locally as in Mode 2. In Mode 3 however, depression of the "ENTER" key will only set an internal "SEND" flag and disable the keyboard to prevent further operator input. The key entered data is then requested by the host computer by its sending an ENQ code while the unit is selected as described above. Such data residing in the display buffer is subsequently transmitted by the TransTerm 6 in the order in which it appears on the display. The message is preceded by a STX code and followed by an EOT code. While the unit is selected, receipt of an EM code will set the internal "SEND" flag. Once input data has been received and validated by the network controller, the network controller (TIM1) should re-enable the keyboard by sending a SI code. The terminal will remain selected until the host computer selects another unit, or until a non-existant unit address is selected.

Unique to the model 6A/B is a special Mode 3 "broadcast" feature which allows all the terminals on a TNET network to simultaneously receive an identical message. This is accomplished by selecting address 255 which all terminals recognize, followed by the broadcast message. In order for this feature to work, all of the terminals as well as the TIM1B TNET Port must be configured for 8 data bits per character on their serial communications port. See Figure 9-1 for additional protocol description.

CHAPTER 10

Communications Protocols

At the higher transmission rates, some of the functions performed by the TransTerm 6 require more time to accomplish than is available between successive received data characters. To avoid loss of data under these circumstances, the TransTerm 6 utilizes a 16 character input buffer operating in a first in/first out (FIFO) fashion. The input buffer could however become full due to one of the following situations:

1) The Host computer has sent successive commands that require considerable execution time (ie. CDB, SSB, etc.)

2) The operator has entered a keyboard function which keeps the TransTerm 6 busy for an extended period of time (in milliseconds of timeframe).

Because the input buffer can "overflow" for one of the above reasons, it is desirable to have a means by which the terminal can regulate the flow of data being sent to it. This capability exists in the TransTerm 6 by the use of one of either of the following methods:

XON/XOFF Protocol

The most efficient and recommended method is the use of the XON/XOFF protocol. Whenever the TransTerm 6 cannot receive any additional data it will transmit an XOFF (Hex 13) code. The sending device should receive and recognize the XOFF code and stop transmitting data to the terminal until it receives and XON (Hex 11) code indicating that the TransTerm 6 is ready to receive more data.

The TransTerm 6 can process incoming data very fast but may need to XOFF the host computer if one of the following conditions occur: The 16 (100 in the TT6A and TT6B) character input buffer fills up to 75% full; when the buffer is depleted back down to 10% full it will issue the XON to the host computer.

Fill Character Protocol

Because the TransTerm 6 input buffer does not accept "NUL" (Hex 00) codes, they can be used to "fill" in time after certain functions. The number of fill characters may have to be determined by experimentation because the execution time of some commands vary with the configuration of the terminal.

CHAPTER 11
INTERFACING

The TransTerm 6 Communications port has an RS-232 compatible 25-pin female connector for establishing the electrical connection with external equipment. The connector is accessible through a cutout in the right side of the terminal case.

RS-232 Interface

The standard TransTerm 6 provides the RS-232 compatible communications signals on the appropriate pins of the communications port connector as follows:

Pin#	EIA/Name	Function
1	AA/FG	Frame Ground
2	BA/TD	Transmitted Data
3	BB/RD	Received Data
4	CA/RTS	Request to Send
5	CB/CTS	Clear to Send
7	AB/SG	Signal Ground
20	CD/DTR	Data Terminal Ready

Uses of the RS-232 interface should be restricted to 50 foot cable lengths. See Figures 11-1 and 11-2.

NOTE

CTS (Pin No. 5) must be active to allow the terminal to transmit.

CURRENT LOOP Interface(optional)

The TransTerm 6 (only) communications port may be optionally configured with a 20 milliamp current loop interface. Both the transmit and receive loops are optically isolated passive circuits (external loop power required). The following pin connections are required for current loop operation:

Pin#	Name	Function
10	CLR+	Receive Data Loop (+)
11	CLR-	Receive Data Loop (-)
12	CLT-	Transmitted Data Loop (-)

13	CLT+	Transmitted Data Loop (+)
15	CLRO	CL Receiver output*

*Tie to RD (Pin 3) for current loop operation.

NOTE

CTS (Pin 5) must be tied to DTR (Pin 20) for current loop operation.

RS-422 Compatible TNET Interface(optional)

The TransTerm 6 communications port may be optionally configured with a RS-422 compatible Tri-State differential interface for use on the Computerwise TNET shop floor network system. The pin assignments for the RS-422 signals on the standard DB-25F connector are as follows:

Pin No.	Name	Function
22	DTD-	Transmitted Data (-)
23	DTD+	Transmitted Data (+)
24	DRD-	Received Data (-)
25	DRD+	Received Data (+)
16	DRO	RS422 RCVR outout*

*Tie to RD (Pin 3) for RS-422 operation.

NOTE

Connect FG (Pin 1) or SG (Pin 7) to DC ground of the host computer using the cables shield.

The above connections are accomplished in the TMA1 modular adapter for TNET (Mode 3) operation.

APPENDIX A

EIA RS-232 Interface Signal List

DB-25F PIN	SIGNAL	DESCRIPTION
1	FG	Frame Gound.Common to SG.
2	TD	Transmit Data output.
3	RD	Receive Data input.
4	RTS	Request To Send output.
5	CTS	Clear To Send input. May be used to hold off terminal's data transmission if the CSE flag is Set (1).
7	SG	Signal Ground.Common to FG.
20	DTR	Data Terminal Ready. High (+12V) whenever terminal is powered on. Also can be used to power terminal from a 12Vdc external source.

Applicable to the 20 milliamp current loop interface option only.

10	CLR+	Current loop receive data (+)
11	CLR-	Current loop receive data (-)
12	CLT-	Current loop transmit data (-)
13	CLT+	Current loop transmit data (+)
15	CLRO	Current loop receiver output. Tie to RD pin for current loop operation.

Applicable to the RS-422 compatible TNET interface option only.

16	DRO	TNET receiver output. Tie to RD pin for TNET. See TMA1 wiring list.
22	DTD-	TNET Transmit data (-)
23	DTD+	TNET Transmit data (+)
24	DRD-	TNET Receive data (-)
25	DRD+	TNET Receive data (+)

APPENDIX B

Specifications

Display

Super Twist Liquid Crystal Technology. Two lines of 40 character positions capable of displaying 96 ASCII characters (upper and lower case alpha plus numeric and special characters), 5 x 7 dot matrix font, .179" high by .124" wide (4.55mm x 3.15mm). Blinking cursor symbol. Variable contrast/viewing angle control from keyboard entered setup mode or remotely with Escape command (6A and 6B only). Optional electroluminescent backlight available.

Keyboard

53 key membrane keyboard with embossed polycarbonate graphics overlay. Hermetically sealed keys on .80" center to center placement. Audible key-click for tactile feedback.
Keyswitch travel - .006"-.008" typical.
Actuating force - 4-8 ounces typical.
Rated life - 10,000,000 cycles (per switch).

Communication

Serial asynchronous full duplex ASCII coding.
EIA RS-232 compatible interface (DB-25F connector)
Data Format - 1 start bit
7/8 data bits
1 Optional parity bit (even, odd, mark space)
1 stop bit
Baud rates - 110,150,300,1200,2400,4800,9600,19.2K

Construction

Light weight aluminum extrusions on the front and back sides, aluminum top and bottom panels with left and right ABS endcaps.

Dimensions

Height:	1.75" (44 mm)
Width:	11.7" (297 mm)
Depth:	6.9" (175 mm)

Weights

Basic unit:	2.23 lbs., 1009 grams
Power Adapter:	0.50 lbs., 230 grams

Operating Environment

Temperature:	0-60 degrees C (32-120 F)
Humidity:	5% to 95% non-condensing

Storage Environment

Temperature:	-20 to +70 degrees C (-4 to +158 F)
Humidity:	0% to 100%

Electrical power (input to power adapter)

Domestic:	105-125 Vrms, 2-wire
Overseas:	198-256 Vrms, 2-wire
Frequency:	47-63 Hertz

Power output from charger(rated)

Voltage:	12 Vdc
Current(Max):	500 milliamps
Rated power:	12 Watts

Power Consumptions (from 12Vdc source)

Basic TT6 terminal:	130 ma.
Display backlight:	+35 ma.
Current loop opt.:	+30 ma.
RS-422 TNET opt.:	+45 ma.

APPENDIX C

TransTerm 5A/B Bar Code Interface Option

The bar code interface option for the TransTerm 6A/B consists of decoding firmware, additional internal circuit components and a panel mounted connector for attachment of a digital wand such as the Hewlett-Packard HBCS-A300 or a wand-emulating CCD or lase scanner. The operation of the bar code decoding firmware is enabled by set-up bit EOP in Setup Register 4. When enabled, the decoding firmware converts the received digital data from the scanning device in the form of a series of 1's (for bars) and 0's (for spaces) into ASCII characters in accordance with the criteria of one the several symbologies that the bar code option decoder will autodiscriminate (Code 39, UPC/EAN, Interleaved 2of5, CODABAR, and Code 128). Successfully decoded data will be internally processed by the TransTerm 6A/B just as if it were keyboard entered data, i.e. in Mode 1, wanded data will be transmitted, and in Modes 2 and 3, wanded data will b placed in display memory. If EAE setup bit is set (1), the wanded data will be followed by a "ENTER" code (Hex 0D) in Mode 1, or will be transmitted automatically when wanded if in Modes 2 or 3.

SETUP Registers for the Bar Code Interface Option

TT6A Setup Register #4

Bit#	Name	Function
1	EOP	Enable Bar Code Input
2	EHD	Enable Header Code
3	EAE	Enable Auto-Enter
4	ESS	Enable CODABAR Start/Stop codes
5	EXC	Enable Extended Code39
6	ECC	Enable Code39 Concatenation
7	ECS	Enable Code39 Checksum Validation
8	N/A	Not used

TT6B Setup Register #4

Bit#	Name	Function
1	EOP	Enable Bar Code Input
2	EHD	Enable Header Code
3	EAE	Enable Auto-Enter
4	ESS	Enable CODABAR Start/Stop codes
5	EXC	Enable Extended Code39
6	ECC	Enable Code39 Concatenation
7	ECS	Enable Code39 Checksum Validation

EOP

Enable Optional Input — When the EOP bit is set (1), the optional barcode decoding interface is activated. When the EOP bit is cleared (0) the interface is disabled.

EHD

Enable Header Code — When the EHD bit is set (1), the ASCII data which is produced by successully decoding a barcode symbol is preceded with a Hex 7E code to identify the source of the data as barcoded input rather than normal keyboard input.

EAE

Enable Auto-Enter — When the EAE bit is set (1), at the completion of a scan of barcoded data, the terminal will perform an ENTER operation (with different results depending upon the operating mode).

ESS

Enable Start/Stop Codes — When the ESS bit is set (1), the ASCII data from the decoding of the symbol will include the symbol's Start and Stop characters at the beginning and end of the data. In the case of a code 3 of 9 symbol, both the Start and Stop characters are an ASCII "*" (Hex 2A). In the case of a CODABAR symbol, the Start and Stop codes are ASCII "A", "B", "C", or "D" (one start code and one stop code).

EXC

Enable Extended Codes — When the EXC bit is set (1), the Code39 decoding algorithm will also decode extended Code 3 of 9 (the full 128 character ASCII set) which uses the $ % / special characters followed by on of the twenty-six alpha codes to derive all 128 possible codes.

ECC

Enable Code39 Concatenation — When the ECC bit is set (1), the Code39 decoding algorithm will detect a trailing ASCII space code (last character of the bar code symbol) and after dropping the

space character will hold the decoded data so that it can be merged with subsequent decoded data.

ECS

Enable Code39 Checksum Validation — When the ECS bit is set (1), the Code39 decoding algorithm will compute the checksum of each decoded symbol and compare it with the trailing checksum character found in the scanned symbol.

MSS

See Magnetic Stripe Reader Interface Option.

TT6A/B Setup Register #5

This setup register allows the user to Enable or Disable the various bar code symbologies which are automatically decoded by the TT6A/B bar code interface. By setting a bit to a '1', the specified symbology is enabled, and by setting a bit to a '0', the symbology is disabled. The SR5 bits are assigned as follows:

Bit#	Function
1	Enable Code 39 (w/Extended Code39)
2	Enable CODABAR
3	Enable Interleaved 2 of 5
4	Enable Code 128
5	Enable UPC-A
6	Enable UPC-E
7	Enable EAN/JAN 13
8	Enable EAN/JAN 8

OPTIONS Register

The value in this register sets the length of the Interleaved 2 of 5 symbols which will be recognized by the decoding algorithm. If the value is set to zero, then any length I2of5 symbol will be allowed. If the register is set to any non-zero value, then only symbols of that exact length (# of digits) will be decoded. The range of acceptable values is from 2 to 32 in even increments.

Bar Code Wand Port Connector

The electrical connections for the bar code interface option is via a 5-pin round DIN connector which has the following pin/signal assignments:

PIN	SIGNAL
1	5 VDC (pwr to scanner
2	Output (0-5 pulses)
3	Ground
4	N/C
5	N/C

APPENDIX D

MAGNETIC STRIPE CARD READER OPTION

The optional Magnetic Stripe Card Reader (MSCR) interface adds the necessary circuitry to the basic terminal to interface a MR-211 read-only magnetic stripe card (credit card, etc.) reader unit to the TransTerm 6A or 6B to capture and decode the data on either Track 2 or optionally Track 1 and convert the data to ASCII. The ASCII data is then processed by the terminal as is key-entered data. The reader is connected to the terminal by a ten inch cable, and if desired, may be mounted on either the side or front of the terminal. See the MR-211 documentation for more information on the operation and use of the reader.

The magnetic stripe reader interface in the TT6A is controlled by settings in Setup Register No. 4 as delineated below.

The magnetic stripe interface in the TT6B can be used with either a Track 1 or a Track 2 reader or with a reader which will read both tracks simultaneously, in which case the data read from Track 1 will take precedence over data read from Track 2.

Setup Register Assignments

TT6A SR#4

Bit#	Name	Function
1	EOP	Enable M.S. Input
2	EHD	Enable Header Code
3	EAE	Enable Auto-Enter
4	—	Not used by M.S.Opt.
5	EMS	Enable M.S. Start/Stop Codes
6	—	Not used by M.S.Opt.
7	—	Not used by M.S.Opt.
8	—	Not used by M.S.Opt.

TT6B SR#4

Bit#	Name	Function
1	EOP	Enable Optional Input
2	EHD	Enable Header Code
3	EAE	Enable Auto-Enter
4	—	Not used by M.S.Opt.
5	—	Not used by M.S.Opt.
6	—	Not used by M.S.Opt.

7	—	Not used by M.S.Opt.
8	EMS	Enable M.S. Start/Stop Codes

The MSCR interface in the TT6A is configured by the following bits in SR4. The remaining bits in SR4 have no effect.

EOP

Enable Optional Input — When the EOP bit is set (1), the optional magnetic stripe reader interface is activated. When the EOP bit is cleared (0) the interface is disabled.

EHD

Enable Header Code — When the EHD bit is set (1), the ASCII data which is produced by successully reading a magnetic card is preceeded with a Hex 7E code to identify the source of the data as being from the reader input rather than keyboard input.

EAE

Enable Auto-Enter — When the EAE bit is set (1), at the completion of a swipe of a magnetic card through the reader, the terminal will perform an ENTER operation (with different results depending upon the operating mode).

EMS

Enable Mag. Stripe Start/Stop Codes — When the EMS bit is set (1), the magnetic stripe decoding algorithm adds the ASCII Start code to the beginning of the decoded data, and adds the ASCII Stop code to the end of the decoded data.

APPENDIX E
AUXILIARY SERIAL PORT OPTION

GENERAL

The optional auxiliary serial communications port provides a means for the TransTerm 6A or 6B to either receive or transmit serial asynchronous ASCII data using TTL voltage levels (0-5V) on the input and output signals. In the case of the TT6A, the aux port is half-duplex and the port on the TT6B is full duplex with built-in hardware hold-off.

Electrical Interface

The signals for the TT6A Aux. port are provided on a 5-pin circular DIN connector (Same connector as is used for the bar code port, See Figure 3-1). The pin assignments are as follows:

Pin #	Description
2	Serial data input
3	Signal Ground
4	Serial data output (5V=space,0V=mark)

TT6A Operating Modes

The Aux serial port in the TT6A can operate in one of three different modes to accomodate most applications. These three modes are described below.

Bidirectional - In this mode, the serial Input pin is used to receive data from the aux device and the Output pin is used to send data to the auxiliary device. The port cannot send and receive simultaneously and it is up to the user to make sure that this does not occur, otherwise data will be corrupted.

Output Only - In this mode, the Output pin is used to send serial data to the aux device and the Input pin (2) is used as a Clear-to-Send input. When the Input pin is high, output is allowed and when the Input pin is low, output is disabled.

Input Only - In this mode, the Input pin is used to receive serial data from the aux device and the Output pin is used as a Ready signal. The

Ready signal is high (+V) when the port is ready to receive data, and it is low when the port is not ready to receive. Ready will go low when the 250 byte input buffer is 3/4 full and will go back high when the buffer is 3/4 empty. This mechanism is used to throttle data transmission from very fast devices.

TT6B Aux Port Operation

The TT6B auxiliary serial port offers more flexibility than the TT6A Aux. port. The TT6B port is full duplex and and has built-in hardware handshaking. The port can both receive and transmit data simultaneously, and has two separate 250 byte buffers inwhich to spool each flow of data. X-ON/X-OFF protocol is recognized by the port's serial transmitter and generated by the port's serial receiver. The protocol is enabled and disabled by the **EXP** bit in Setup Register 2.

Communications Format

Data bits/character	- 8
Parity Bit	- None
Stop Bit	- 1
Baud Rate(s)	- 110 to 9600

SETUP Register Assignments

The aux serial port is configured by the bits in Setup Register 4 of the TT6A or Setup Register 6 of the TT6B. The operating mode and baud rate of the aux port are initialized at terminal reset, or power-up. If either value is changed via the Setup mode, the terminal should be reset to invoke the new setup values. TT6A SR#4 is defined as follows:

TT6A SR#4

Bit #			Description
1	2	3	Baud Rate
0	0	0	9600
1	0	0	4800
0	1	0	2400

1	1	0	1200
0	0	1	600
1	0	1	300
0	1	1	150
1	1	1	110

7	8	Operating Mode
0	0	Bidirectional
1	0	Output Only
0	1	Input Only
1	1	Not Allowed

TT6B SR#6

Bit	Name	Function
1	BR1	Baud Rate Selection
2	BR2	Baud Rate Selection
3	BR3	Baud Rate Selection
4	PS1	Parity Selection
5	PS2	Parity Selection
6	PEN	Parity Enable
7	DBS	7/8 Data Bits
8	CSE	CTS Enable

The above Setup bits have the same definition as the those in SR 1.

Software Control

Serial data input via the AUX port is transmitted to the host computer as if it had been entered from the keyboard of the terminal.

Serial data from the host computer is either sent to the display of the terminal or sent to the AUX port. The host computer can direct the terminal where to send data with the following control codes:

DC2 (12H) -> Will direct data from the host computer to the TT6A/B AUX port.
DC4 (14H) -> Will direct data from the host computer to the TT6A/B display.
All characters received by the terminal after a DC2 will be sent to the AUX port until the terminal receives a DC4.

Auxiliary Serial Port Connector (DB9F) Pin/Signal Definition.

PIN	I/O	DESCRIPTION
1	NC	Carrier Detect
2	I	Receive Data
3	O	Transmit Data
4	O	Data Terminal Ready
5	-	Ground
6	NC	Data Set Ready
7	O	Request to Send
8	I	Clear to Send
9	NC	Ring

APPENDIX F

Restoring Factory Default SETUP Values

In certain circumstances, due to known or unknown causes, the TT6, TT6A, TT6B may fail to operate properly, or may become locked out of the SETUP mode because Bit 7 of Register 3 has been set to a '1'. In either of these situations, the following procedure(s) will clear the TT6/A/B setup memory and reprogram it with the origional setting that it contained when it arrived from the factory.

TransTerm 6 Procedure.

1. Disconnect TT6 from power.
2. Remove right side endcap and backpanel.
3. Install a jumper between pins 2 and 20 of the 40-pin LSI IC controller.
4. Apply power to TT6 and wait for power-up reset to complete.
5. Remove power from TT6.
6. Remove jumper installed in step
7. Re-assemble enclosure.
8. Restore TT6 SETUP to your requirements.

TransTerm 6A/B Procedure.

1. Disconnect TT6A/B from power.
2. Press and hold both the CONTROL key and the left SHIFT key.
3. Apply power to the TT6A/B, wait for power-up reset to complete.
4. Release the CONTROL and SHIFT keys.
5. Remove power from TT6A/B.
6. Apply power to TT6A/B.
7. The TT6A/B display will present:
   "TRANSTERM 6A/B"
   "TT6A/B Vx.xx" (Firmware version)

8. Restore TT6A/B SETUP to your requirements.

Product Warranty

This equipment is warranted to be free from material defects and faults of workmanship for a period of 90 days from the date of original purchase. At our option, Computerwise agrees to repair or replace any such defective equipment upon its return to our factory in Olathe, KS.

This warranty is limited to defects arising under normal usage and does not cover malfunctions or failures resulting from the misuse, abuse, neglect, alteration, modification, or repairs by other than Computerwise or its authorized service agent(s). This warranty does not cover damage to the membrane keyboard. NOTE: Repair or replacement is the sole remedy hereunder.

This limited Warranty is in lieu of all other warranties, expressed, implied, or statutory, including any warranties of merchantability or fitness for a particular purpose, and extends to the original Buyer alone. In no event shall Computerwise, Inc. be liable for lost profits or any incidental or consequential damages caused by this equipment or related software, regardless of whether Computerwise is forwarned of such possibility of damages.

Some states do not allow the exclusion or limitation of incidental or consequential damages, or allow limitations on how long an implied warranty lasts. If you are a resident of such a state, the above limitations or exclusions may not apply to you. This warranty gives you specific legal remedies, and you may also have other rights which may vary from state to state.

To obtain warranty service during the warranty period, you must contact Computerwise and notify us of the exact nature of the failure along with the model and serial number of the piece of equipment (if applicable).

FCC Compliance

This equipment radiates radio frequency energy and if not installed and used in accordance with the instructions in this manual may interfere with local RF communications. It has been tested and found to comply with the limitations for a Class B computing device pursuant to Subpart J of Part 15 of the FCC Rules for commercial environments. Operation of this equipment in a residential area is likely to cause interference in which case the user at his own expense will be required to take

whatever measures may be necessary to correct or mask the interference by one or more of the following measures:

* Reorient the receiving antenna.

* Relocate the product with respect to the receiver.

* Move the product away from the receiver.

* Plug the product into a different AC power outlet.

If the above measures fail to solve the interference problem the user should consult the dealer or an experienced RF technician for additional suggestions. The user may find the following FCC booklet helpful:

"How to Identify and Resolve Radio-TV Interference Problems"

This booklet may be ordered from the U.S. Government Printing Office. Washington, D.C. 20402. STOCK No. 004-000-00345-4.